CLAIMS

1. A sheath assembly for an invasive probe, comprising:

an internal sheath for covering a probe; and

at least one channel tube external to the internal sheath, the channel tube being foldable into a closed state in which the tube does not define a channel, or openable into an open state in which the tube defines a channel that extends along at least a portion of the sheath assembly.

2. A sheath assembly according to claim 1, wherein the channel tube when in a closed state does not unfold from the closed state absent an external force.

3. A sheath assembly according to claim 2, wherein the channel tube is folded in an unorganized manner in the closed state.

4. A sheath assembly according to claim 2, wherein the channel tube is folded in an organized manner in the closed state.

5. A sheath assembly according to claim 2, wherein the channel tube is pleated in the closed state.

6. A sheath assembly according to claim 2, wherein the channel tube is folded over the internal sheath, in the closed state.

7. A sheath assembly according to any of claims 1-6, wherein the channel tube is self-collapsible, such that it does not remain in the open state, without a force not due to the channel tube that holds it in the open state.

8. A sheath assembly according to any of claims 1-6, wherein the channel tube does not self-collapse out of the open state, unless an external force is applied to the channel tube.

9. A sheath assembly according to claim 8, wherein the channel tube is deformed in a manner which prevents self-collapsing out of the open state.

10. A sheath assembly according to any of claims 1-6, wherein the channel tube is heat-set in the closed state so as to remain in the closed state until being moved to the open state.

11. A sheath assembly according to any of claims 1-6, wherein the channel tube is held in the closed state by an adhesive so as to remain in the closed state until being moved to the open state.

12. A sheath assembly according to any of claims 1-6, wherein the channel tube surrounds the internal sheath.

13. A sheath assembly according to any of claims 1-6, wherein the tube does not surround the internal sheath.

14. A sheath assembly according to any of claims 1-6, wherein the channel tube is directly attached to the internal sheath.

15. A sheath assembly according to claim 14, wherein over most of the length of the sheath assembly the external sheath is not attached to the internal sheath.

16. A sheath assembly according to claim 14, wherein over most of the length of the sheath assembly the external sheath is attached to the internal sheath along at least one longitudinal line.

17. A sheath assembly according to any of claims 1-6, wherein the channel tube and the internal sheath are connected, separately, to a proximal connector.

18. A sheath assembly according to any of claims 1-6, wherein the channel tube is formed with an internal notch adapted to receive a dovetail of a working tube.

19. A sheath assembly according to any of claims 1-6, wherein the channel tube does not have an aperture at its distal end.

20. A sheath assembly according to any of claims 1-6, wherein the channel tube has an aperture leading out of the sheath assembly, along its length.

21. A sheath assembly according to any of claims 1-6, wherein the channel tube is formed with a foldable lobe of a limited axial extent relative to the channel tube, mounted on the channel tube and open to the channel defined by the channel tube.

22. A sheath assembly according to any of claims 1-6, comprising an electrode mounted on an external surface of the channel tube.

23. A sheath assembly according to any of claims 1-6, wherein the at least one channel tube extends over at least 50% of the internal sheath.

24. An invasive tool, comprising:

an elongate probe; and

at least one flexible channel tube, for coupling to the elongate probe, the channel tube being foldable into a closed state in which the tube does not define a channel, or openable into an open state in which the tube defines a channel that extends along at least a portion of the sheath assembly,

wherein the channel tube is held in the closed state, absent a force that moves the channel tube to the open state.

25. An invasive tool according to claim 24, wherein the channel tube is heat set in the closed state.

26. An invasive tool according to claim 24, wherein the channel tube is fixed in the closed state by an adhesive.

27. An invasive tool according to claim 24, comprising an internal sheath slid over the elongate probe and wherein the at least one channel tube is attached to an external surface of the internal sheath.

28. An invasive tool according to any of claims 24-27, comprising an electrode mounted on an external surface of the channel tube.

29. An invasive tool according to any of claims 24-27, wherein the channel tube is non-elastic.

30. A channel add-on for an invasive probe, comprising:

at least one channel tube, for coupling to an invasive probe, which is foldable into a closed state in which the tube does not define a channel, or openable into an open state in which the tube defines a channel; and

means for opening the tube into the open state while the tube is within the patient.

31. A channel according to claim 30, wherein the means for opening the tube comprise means for dissolving an adhesive.

32. A channel according to claim 30, wherein the means for opening the tube comprise means for injecting a fluid into the tube.

33. A method of providing an endoscopic channel, comprising:

inserting into a patient, a probe with a sheath assembly including a channel tube being foldable into a closed state in which the tube does not define a channel, or openable into an open state in which the tube defines a channel that extends along at least a portion of the sheath assembly; and

opening the tube into the open state while the tube is within the patient.

34. A method according to claim 33, wherein opening the tube into the open state comprises inserting a working tube or a tool into the tube.

35. A method according to claim 33, wherein opening the tube into the open state comprises dissolving an adhesive holding the tube folded.

36. A method according to claim 33, wherein opening the tube into the open state comprises injecting a fluid into the tube.

37. A method according to any of claims 33-36, wherein inserting the probe comprises inserting while the channel tube is held in the closed state.

38. A method according to any of claims 33-36, wherein inserting the probe comprises inserting while the channel tube is not held in any specific state.

39. A method according to any of claims 33-36, wherein the channel tube surrounds the probe.

40. A method according to any of claims 33-36, wherein inserting the probe comprises inserting a probe surrounded by an internal sheath.

41. A method according to any of claims 33-36, wherein the channel tube dopes not remain in the open state, unless an external force keeps it in the open state.

42. A method according to any of claims 33-36, wherein the channel tube does not self-collapse out of the open state, unless an external force is applied to the channel tube.

43. A sheath assembly for a probe, comprising:

an internal sheath configured to isolate a probe from body fluids; and

an external sheath surrounding the internal sheath, the internal and external sheaths being directly connected to each other.

44. A sheath assembly according to claim 43, wherein the internal and external sheaths are connected to each other over at least one axial line extending over a segment of the length of the sheaths.

45. A sheath assembly according to claim 44, wherein the internal and external sheaths are connected over at least two longitudinal lines, so as to define a plurality of separate channels between the sheaths.

46. A sheath assembly according to claim 43, wherein the internal and external sheaths are connected non-symmetrically radially.

47. A sheath assembly according to claim 43, wherein the internal and external sheaths are connected radially symmetrically.

48. A sheath assembly according to any of claims 43-47, wherein the internal and external sheaths are connected substantially only at a plurality of circumferential points at a distal end of the external sheath.

49. A sheath assembly according to any of claims 43-47, wherein the internal and external sheaths coextend at their distal ends, such that their distal ends extend to a same point.

50. A sheath assembly according to any of claims 43-47, wherein the internal sheath extends beyond the distal end of the external sheath.

51. A sheath assembly for a probe, comprising:

an intermediate sheath configured to define a first channel between the probe and the intermediate sheath; and

an external sheath adapted to define a second channel between the intermediate sheath and the external sheath.

52. A sheath assembly according to claim 51, comprising a proximal port connected to the first channel.

53. A sheath assembly according to claim 51, comprising an internal sheath configured to isolate the probe from body fluids.

54. A sheath assembly according to any of claims 51-53, wherein at least one of the intermediate sheath and the external sheath is stretchable so as to define the respective channel.

55. A sheath assembly according to any of claims 51-53, wherein at least one of the intermediate sheath and the external sheath includes loose material that can be unfolded to define the respective channel.

56. A sheath assembly for a probe, comprising:
an internal sheath for covering an elongate probe;
a channel tube with a variable transverse extent, external to the internal sheath; and
a nozzle connected to the distal end of the channel tube.

57. A sheath assembly according to claim 56, wherein the channel tube comprises a foldable channel.

58. A sheath assembly according to claim 56, wherein the channel comprises a stretchable channel.

59. A sheath assembly according to any of claims 56-58, wherein the nozzle is directed in a direction substantially different from the main axis of the distal end of the channel.

60. A sheath assembly according to any of claims 56-58, comprising a window at the distal end of the internal sheath and wherein the nozzle is directed in a direction suitable for flushing the window.

61. A sheath assembly for a probe, comprising:
an internal sheath for covering an elongate probe; and
a channel tube with a variable transverse extent, external to the internal sheath, the channel tube not having an aperture at its distal end.

62. A sheath assembly according to claim 61, comprising one or more holes along an axial length of the channel tube.

63. A sheath assembly, comprising:
an endoscopic tube defining a channel with a variable transverse extent, including a longitudinal notch formed in the tube; and

a working tube comprising a protrusion adapted to fit into the notch.

64. A sheath assembly according to claim 63, wherein the protrusion has a dovetail shape.

65. A sheath assembly according to claim 63, wherein the tube comprises a foldable tube.

66. A sheath assembly according to any of claims 63-65, wherein the tube comprises an inflatable tube.

67. A method of inserting a working tube into a channel, comprising:

providing a guide wire within the channel; and

inserting the working tube into the channel along the guide wire, while the channel is within a patient.

68. A method according to claim 67, wherein providing the guide wire comprises providing the guide wire in the channel before the channel is inserted into the patient.

69. A method according to claim 67, wherein providing the guide wire comprises providing the guide wire in the channel after the channel is inserted into the patient.

70. A method according to any of claims 67-69, wherein providing the guide wire comprises providing the guide wire such that both ends of the guide wire extend out of a proximal end of the channel.

71. A method according to any of claims 67-69, wherein providing the guide wire comprises providing a guide wire that is anchored to a distal end of the channel.

72. A method according to any of claims 67-69, wherein providing the guide wire comprises providing a guide wire that is threaded through a distal end of the channel.